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Ser 1811GM/L3146
14 Jan 1993

Mr. Tom Lanphar
Department of Toxic Substances Control
700 Heinz Ave., Suite 200
Berkeley, CA 94710

Subj: RESPONSES TO COMMENTS ON DRAFT FINAL SOLID WASTE ASSESSMENT
TEST (SWAT) REPORT RI/FS PHASES 5 AND 6 AT NAS ALAMEDA

Dear Mr. Lanphar:

We are providing as enclosure (1), responses to your December 2, 1992 comments on the draft final Solid Waste Assessment Test (SWAT) report for the RI/FS Phases 5 and 6.

If you have any questions regarding our responses to your comments, please contact either Mr. Gary J. Munekawa, Code 1811GM, (415) 244-2524 or Mr. George Kikugawa, Code 1811GK, (415) 244-2559.

Sincerely,

original signed by:

LOUISE T. LEW
Head, Installation Restoration Section

Encl: (1) Responses to Comments on Draft Final SWAT report

Copy to (w/ encl.):
California Regional Water Quality Control Board (Attn: James Nusrala)
US Environmental Protection Agency (Attn: Julie Anderson)
NAS Alameda (Attn: Lt. Mike Petouhoff)
PRC Environmental Management, Inc. (Attn: Duane Balch)
James M. Montgomery, Consulting Engineers, Inc. (Attn: Ken Leung)

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12.0 RESPONSE TO COMMENTS

This section presents the Navy's response to the State of California Environmental Protection Agency Department of Toxic Substances Control's (DTSC) comments on this SWAT report received in a letter dated December 2, 1992. The DTSC comments are presented verbatim in bold typeface. The Navy responses are in normal typeface.

GENERAL COMMENTS

Comment No. 1:

The Water Quality Criteria (WQC) for the protection of marine life or the Maximum Contaminant Levels (MCLs), whichever is more stringent, will be the standards to which the analytical results will be compared to until ARARs are established.

Response to Comment:

The purpose of the SWAT investigation is to evaluate if the landfills are leaking. Determination of the health risks and cleanup goals will be conducted during the risk assessment. Currently no groundwater at the base is being used as a potable water supply. The groundwater flow is toward San Francisco Bay and the Oakland Inner Harbor. TDS data were collected from all wells over the year of quarterly sampling. This information was used to determine whether the groundwater at NAS Alameda meets the criteria of 3,000 mg/L or less to be classified as a potential potable groundwater source (State Water Resources Control Board Resolution No. 88-63). The groundwater in the first water-bearing zone at Sites 1 and 2 ranges from fresh to saline, and in the second water-bearing zone brackish to saline. Use of WQC is appropriate to conduct a preliminary evaluation of current potential impact.

Utilizing either WQC or MCL is important for reaching the appropriate data quality objectives. Discussions to determine ARARs for the two sites will need to be on a site specific and chemical specific basis. The applicability of MCL's as ARARs will be evaluated in this process.

Comment No. 2:

Indicate the rationale for the number and depths of soil samples taken at each boring for Sites 1 and 2.

Response to Comment:

A surface soil sample was collected at each cluster of borings to determine if the surface soils contained chemicals of concern. A second sample was collected from the vadose zone (above the water table) at each well cluster to evaluate whether a source of chemicals of concern are present in the shallow subsurface soils. At selected locations soil samples were also collected for chemical analysis from the zone to be screened.

Comment No. 3:

Propose a detailed plan to discuss continuous monitoring of wells to determine movement of contamination, effect of seasonal changes, confirm analytical results on some wells, to clarify data that were qualified, and to confirm

data that could be a result of laboratory contamination or error, etc.

DTSC has made comments below regarding monitoring of specific wells. Other wells need to be continuously monitored for the reasons stated above possibly at different time intervals. In general, this is in agreement with your preliminary recommendation contained in the executive summary.

Response to Comment:

The objective of the SWAT report is to provide a summary of the results of the Phases 5 and 6 investigation and to identify where additional field investigation is needed. The SWAT report accomplished these objectives. Details about the number and types of samples to be collected in future monitoring will be provided in the work plan to be prepared for the recommended additional investigations. The work plan will be submitted to DTSC for review and comment prior to implementing the additional investigations.

Comment No. 4:

Submit all original field notes and lithologic logs.

Response to Comment:

Original field logs are reviewed by senior personnel after field work is completed. Logs are checked for consistency and descriptions are compared to archived soil samples collected at the time of drilling. In this review process, logs are edited. The edited versions submitted to the DTSC in the SWAT report are accurate and complete and provide information in a format more easily interpreted than the original field logs.

Comment No. 5:

Clarify the statements made in the SWAT Report, Volume 1 in Sections 2, 8, and 9. Indicate clearly ground water flow direction in each water bearing zone at each site. Also, please be more precise as to whether the direction is west, northwest, etc., rather than using the word "outwardly."

Response to Comment:

The statements concerning groundwater flow directions have been clarified in Sections 2, 7, 8, and 9 by adding the directions of movement, north, south, and west.

Comment No. 6:

There are some detected volatiles and semi-volatiles in the deep water bearing zone in both sites (e.g., acetone, bis[2-ethylhexyl]phthalate, etc.). The Navy has indicated that they may be caused by laboratory contaminants, plastic containers, or the rope being used in the sampling. The Navy should submit a plan to confirm whether the contamination are indeed caused by the sources indicated above, or submit preventive measures so that these kinds of contamination will be avoided in the future. The outcome of this plan or preventive measures will assist in the future evaluation of data, and efforts will be focused more on the actual problem at the site.

Response to Comment:

More strict quality assurance and quality control measures will be included in the work plans and addenda to the QAPjP for future work at the sites. The work plan and addenda to the QAPjP will be submitted for DTSC review prior to implementation of the additional investigations.

SPECIFIC COMMENTS

Site 1 (Evaluation of Analytical Data)

Comment No. 1:

At boring M-028A, acetone is detected at 610 µg/kg at 2.5 feet deep. Although detected at less than a reporting limit of 5,000 and 2,000 µg/l - the real concentration of acetone is unknown. Vinyl Chloride, 1,2-dichloroethene, and toluene were also detected in high concentration at well M-028A.

Because of the above concerns, wells M-028A and E should be continued to be monitored on a quarterly basis.

Response to Comment:

Wells M-028A and E are planned to be sampled quarterly. Details of the sampling schedule will be presented in the work plan for the additional investigations.

Comment No. 2:

Of all sampling locations, monitoring well M-028A was observed to contain the highest concentration of organic contaminants in ground water. The Navy should investigate the source of this contamination by looking into past records of disposal, and if practicable by doing additional soil borings in this area to define the horizontal and vertical extent of contamination. This additional information will assist in planning any kind of remediation for Site 1.

Response to Comment:

Additional borings are recommended for future work in the vicinity of well cluster M-028 at Site 1. Details of the number and locations of the recommended borings will be presented in the work plan for the additional investigations.

Comment No. 3:

Continue to monitor wells M-001E, M-029A and E for both volatiles and semi-volatiles to see any changes in detected concentrations over time.

Response to Comment:

Wells M-029A, E, and M-001E are planned to be sampled quarterly. Details of the sampling schedule will be presented in the work plan for the additional investigations.

Comment No. 4:

Because of the locations of M-006, M-007, and M-009, it is uncertain whether the TPH, and oil and grease or other contaminations are originating from the landfill, from the vicinity of the wells or east of the wells. Include these areas that need to be investigated to determine the extent of TPH problem.

Response to Comment:

Additional soil sampling for TPH by modified EPA Method 8015 is recommended in the SWAT report. Sampling locations in the vicinity of wells M-006, M-007, and M-009, will be included in the work plan for additional work.

Comment No. 5:

You have been advised of the Department's position on the use of background values as clean-up levels. We find the following of concern in soil: arsenic (98.1 mg/kg) and antimony (600 mg/kg) at 13 feet at M-001A; barium (6990 mg/kg) at the surface of M-002A; lead (261 mg/kg) and zinc (555 mg/kg) at 0.5 at M-027A; copper (1760 mg/kg) at 2.5 feet of M-028A, 6210 mg/kg at 3 feet of M-028E; and 1560 mg/kg at 4 feet of M-029A.

In the ground water, copper is detected in several wells above the Water Quality Criteria of 2.9 µg/l. The only metal detected in ground water above the MCL is antimony in wells M-025A and M-002A. (MCL for antimony is 6 µg/l).

Response to Comment:

The final cleanup goals will be established based on the baseline health risk assessment. Background samples were used for comparative purposes not as proposed cleanup levels.

Comment No. 6:

The B and C Wells should continue to be monitored for Bis(2-ethylhexyl)phthalate and acetone to confirm laboratory contamination or any other source of contamination.

Response to Comment:

The work plan for additional investigations at Site 1 will include groundwater sampling of the B and C wells for volatile organic compounds and semivolatile organic compounds.

Site 2 (Evaluation of Analytical Data)

Comment No. 1:

Similar to previous investigations (i.e., Data Summary Report), phthalates, especially Bis(2-ethylhexyl)phthalate, and polynuclear aromatic hydrocarbons, are found in several wells. Of concern here is Bis(2-ethylhexyl)phthalate at 32 feet below the ground surface.

Response to Comment:

Phalates are associated with plastics and may be related to sampling or laboratory artifacts. More strict quality assurance and quality control measures will be included in the work plans and addenda to the QAPjP for future work at the sites. The work plan and addenda to the QAPjP will be submitted for DTSC review prior to implementation of the additional investigations.

Comment No. 2:

Make note that Bis(2-ethylhexyl)phthalate in several wells are above the MCL of 6 µg/l. The wells are: M-011A, 14A, 19A and E, 20E, 21E, 22A and E, 23A and E, and 24A and E.

Response to Comment:

All of the wells mentioned above except well M-014A are in the brackish to saline zone (TDS >3,000 mg/L). Therefore the water in this area is not considered a potable water supply and MCLs may not be appropriate for these wells. The wells mentioned above will be included in the work plans for future sampling at Site 2.

Comment No. 3:

Continue to monitor wells 24A and E to verify concentration and confirm the existence of semi-volatiles in these wells.

Response to Comment:

The SWAT report recommended that wells M-024A and E at Site 2 be included in future quarterly groundwater sampling.

Comment No. 4:

Benzene, chlorobenzene, and acetone were detected in ground water at wells 24A and E. Detected benzene and chlorobenzene were above the MCL levels of 1 and 30 µg/l, respectively. Chlorobenzene and acetone were also detected in soil.

Response to Comment:

Wells M-024A and E are in the brackish zone (TDS >3,000 mg/L). Therefore the water in this area is not considered a potable water supply and MCLs may not be appropriate for these wells. The SWAT report recommended that wells M-024A and E at Site 2 be included in future quarterly groundwater sampling.

Comment No. 5:

Presence of bis(2-ethylhexyl)phthalate and acetone should be continued to be monitored in the B and C wells quarterly to confirm any laboratory or other source of contamination.

Response to Comment:

The work plan for additional investigations at Site 2 will include groundwater sampling of the B and C wells for volatile organic compounds and semivolatile organic compounds.

Comment No. 6:

Metals such as: copper, silver, and nickel are consistently detected above the WQC in most A and E monitoring wells however, only detected in M-014B, M-020B, M-021C, and M-023B in the lower water bearing zone. Zinc was also detected above the WQC in the A and E, and B and C wells. Antimony was also observed to exceed the MCL at A and E wells (M-010A, M-011A) and at B and C wells (M-023B and M-021C).

Response to Comment:

Wells M-023B and M-021C are in the brackish zone (TDS >3,000 mg/L). Therefore the water in this area is not considered a potable water supply and MCLs may not be appropriate for these wells. All wells mentioned above will be included in the work plans for future sampling at Site 2.

Quality Control/Quality Assurance

Comment No. 1:

The new promulgated MCL for antimony is 6 µg/l. The Navy should ensure that the detection limit for antimony is lower than 6 µg/l.

Response to Comment:

This information is noted. The new work plan and QAPJP will require appropriate detection limits for chemical compounds and metals of concern.

Comment No. 2:

Since the analytical results are to be compared to the WQC when it is more stringent than the MCL or vice versa, the Navy should make an effort to inform the laboratory to try to achieve detection levels lower than the WQC or as close as possible to it.

Response to Comment:

In future work the laboratory will be informed of the detection limits for particular compounds and will be requested to achieve detection limits lower than the WQC or MCL when ever possible and which ever is more stringent.

Site Geologic and Hydrogeologic Characterization

Cross Section

Comment No. 1:

Cross Section A-A'

- a. In boring M-12B, the clay zone shown at the base of the artificial fill actually consists of layers (approximately one-foot thick) of clay and clayey gravel (from 27 to 31 feet bgs). This zone may correlate to the clayey gravel zone from 24 to 30 feet bgs in boring M-13C.
- b. In boring M-7C, some detail from the boring is missing in the cross section. In the Bay Mud unit, a lens of poorly-graded (well-sorted) sand

(SP) is not indicated from 35 to 44 feet bgs. In the Alluvial/Eolian Unit, the interval from 51 to 74 feet bgs consists of poorly-graded sand, not silty sand (SM). Both of these SP zones may correlate to the clayey sand (SC) zones observed in boring M-10B between 56 and 74 feet bgs.

Response to Comment:

The discrepancies between the boring logs and cross sections have been checked and revised. A revised cross section A-A' is included in the Final SWAT report.

Comment No. 2:

Cross Section B-B'

- a. The clay zone indicated in boring M-105B from 19 to 32 feet bgs is actually a zone of interbedded clay, poorly-graded sand (SP), and clayey sand (SC). The interbeds range from 1 foot to 3 feet thick. This should be indicated on the cross section as CL/SC/SP. This zone correlates to a similar zone seen in boring M-103B (see below).
- b. In boring M-103B, the zone from 14 to 19 feet bgs is interbedded silty sand (SM), poorly-graded sand (SP), and clay (CL). The zone from 27 to 66 feet bgs consists of interbedded clay, silty sand, and clayey sand. It should be indicated as CL/SM/SC on the cross section. This correlates to the zone discussed above in boring M-105B and to boring M-104C.

Response to Comment:

The discrepancies between the boring logs and cross sections have been checked and revised. A revised cross section B-B' is included in the Final SWAT report.

Comment No. 3:

Cross Section C-C'

- a. In boring M-24E, the upper 3 feet is sandy gravel (GP). From 3 to 10 feet bgs, the lithologic log shows wood with sand.
- b. In boring M-21C, the silty gravel (GM) zone present from 8 to 17 feet bgs is not shown on the cross section. It correlates to the GM zone in boring M-22E. From 18 to 22 feet bgs, a silty zone (ML) is missing above the second GM zone. This silt zone may correlate to the thin clay zones shown in borings M-19E, M-20B, and M-22E.
- c. From 1 to 9 feet bgs in boring M-26E is a zone of gravelly sand (SW). This correlates to a zone of SW that is also not shown in boring M-27C from 8 to 17 feet bgs. The sand (SP) zone shown

beginning at 42 feet is twice as long as indicated on the cross section (extends to 54 feet).

The tendency on these cross sections has been to show zones of interbedded clay and sands in the Bay Mud Unit as just clay. This is misleading and should be corrected on the cross sections. The significance of the well-sorted sand is that these units represent zones of relatively high transmissivity.

Response to Comment:

The discrepancies between the boring logs and cross sections have been checked and revised. A revised cross section C-C' is included in the Final SWAT report. The cross sections have all been revised and units as thin as one to two feet have been included. The well sorted sands are zones of relatively high transmissivity. Many of the well sorted sand zones do not correlate laterally from well to well.

Permeability Values for Aquitards

Comment No. 1:

On page 8-5 is a discussion of the laboratory test results for vertical permeability in the Bay Mud Unit, Alluvial/Eolian Unit, and the Estuarine Unit. All of these values were based on samples collected only from the clay zones in these three units. The SWAT Report does not discuss why laboratory permeability tests were not run on the silty or sandy samples. Slug test results for horizontal permeabilities are available only from the water-bearing zones in the Artificial Fill and the Alluvial/Eolian units.

It is misleading to state that "the vertical hydraulic conductivity of the Holocene Bay Mud Unit ranges from 2.53×10^{-8} cm/sec to 3.16×10^{-8} cm/sec." This is based only upon the clay zones, but the Bay Mud Unit also contains sandier zones with higher permeabilities. The same comment applies to the Alluvial/Eolian Unit. These values should be given as maximum vertical permeabilities.

Response to Comment:

Samples collected from the clayey zones of the units were analyzed to determine the minimum vertical permeabilities. The text will be revised to indicate that the samples analyzed are from clayey zones in the units. The slug tests were conducted after the wells were installed, so the horizontal permeability data is from the screened intervals only.

Monitoring Well System

Comment No. 1:

In the zone from the M-27 to the M-1 well clusters (1200 feet) there are no wells in the second water-bearing zone. This is also the area with the highest levels of contaminants. The Bay Mud Unit in this area is predominately clay, but there are some contaminants (acetone, carbon disulfide, chloroform, and

chloromethane) in the deeper zone in wells M-1B and M-27B. This may be an area where another B or C well is needed.

Response to Comment:

One of the additional borings recommended for future work in the vicinity of well cluster M-028 will be to the second water-bearing zone. Details of the boring will be presented in the work plan for the additional investigations.

Comment No. 2:

Additional wells are necessary between Site 1 and Site 2. Additional information on the stratigraphy of the Holocene Bay Mud (since there are no soil borings taken within the landfills themselves) and the extent of downgradient contamination from existing wells is necessary.

Response to Comment:

A cone penetrometer test survey is proposed in future work at Sites 1 and 2. This survey will help in determining the stratigraphy of the Holocene Bay Mud Unit.

The wells on the north, south, and west perimeter of Sites 1 and 2 are downgradient of the landfills. The current groundwater monitoring network is adequate to monitor the quality of the groundwater leaving Sites 1 and 2 in the first and second water-bearing zones.

Field Methods (Appendix C)

Comment No. 1:

The results of the Geiger-Mueller readings are not indicated on the lithologic logs in Appendix E, as stated on page C-1. Please provide this information.

Response to Comment:

The readings on the Geiger-Mueller meters were below detection and not included on the final boring logs. A note will be added to the boring logs to indicate that the readings were below detection limits.

Comment No. 2:

The last paragraph on page C-3 describes the procedure used for collecting soil samples for volatile analysis. The soil was removed from the soil sampler and placed into glass jars with no headspace. The samples should have been collected in sample sleeves, as the geotechnical samples were. Any future soil samples collected for volatile analysis should be collected using sample sleeves with end caps.

Response to Comment:

This procedure is in accordance with and set forth in the Naval Energy and Environmental Support Activity (NEESA) document "Sampling and Chemical analysis Quality Assurance Requirements for the Navy Installation Restoration Program" document (second revision June 1988) and the approved Work Plan. A copy of the cover and pages 14 and 16 of the above document are attached. It states that samples will be collected in glass jars with a teflon® liner. The work plans for future

work will be sent to DTSC for review and comment and incorporate DTSC recommended sampling methods.

Comment No. 3:

The last paragraph on page C-8 describes the use of a travel blank canister. This is not the appropriate way to use a trip blank. The blank should contain organic free water from the lab. The blank should remain closed and travel with the samples to the lab. It should not be opened in the field, then closed and sent to the lab. Any contamination detected would be more indicative of ambient air conditions. It would not tell you if volatiles were leaking from one closed container and contaminating another closed container. For all future sampling events, trip blanks must be utilized correctly, according to SW-846, Volume 1A, Chapter 1 (see Attachment A).

Response to Comment:

The trip blank VOA (volatile organic analysis) vials were prepared at the laboratory using organic free water. The trip blank vials were not opened in the field or during transport to the laboratory. The container holding the VOA vials were opened to allow the trip blanks to be exposed to conditions similar to the other samples. The trip blanks were sent in the coolers with the samples to be analyzed for volatile organic compounds. In future field work the trip blank VOA vials will not be put back in the travel blank canister for the trip from the field to the laboratory.

Borehole Logs (Appendix E)

Comment No. 1:

In some cases, there is no geotechnical data listed in tables 7-1, 8-3, and 9-1 for geotechnical samples indicated on the lithologic logs. Some examples are: M-18E at 33 and 43 feet bgs; M-20E at 31 feet bgs; M-22E at 10 feet bgs; M-25E at 20 feet bgs; and M-26E at 17 feet bgs.

Response to Comment:

Many more samples were collected for geotechnical analysis than were analyzed. Only selected samples were sent to the laboratory for analyses.

**SAMPLING AND CHEMICAL ANALYSIS QUALITY ASSURANCE
REQUIREMENTS FOR THE NAVY
INSTALLATION RESTORATION PROGRAM**

**NEESA 20.2-047B
Project Manager: Anthony R. Sturtzer**

**September 1985
First Revision June 1986
Second Revision June 1988**

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site shall be considered. Any state- or region-specific requests must be addressed in the site work plan.

3.3 SAMPLING DESIGN

Every site is unique in its own way. To this end, a sampling rationale shall be included with the work plan. The rationale should define and explain thoroughly the sampling statistics, the equipment involved, and anticipating data to be gained by this proposed methodology.

3.4 PRESERVATIVES

After samples have been taken, they shall be sent to the laboratory for analysis within 24 h after collection to ensure that the most reliable and accurate answers will be obtained as a result of the analysis. The holding time begins from the date of collection in the field. Preservatives shall be added in the field. Tables 3.1, 3.2, and 3.3 present the holding times, type of containers, and preservatives to be used. A table corresponding to each of the three different methods such as those from the *Federal Register*; SW-846 3rd ed.; and CLP is presented. The site-specific plan shall outline which preservatives will be used, and it shall be based on these tables. Freezing of samples shall not be permitted.

3.5 SAMPLE CONTAINER CLEANING PROCEDURES

In general, glass bottles with Teflon lids are used for organic samples, while polypropylene is used for metals and other inorganics. The following specifies the bottle cleaning required. If precleaned bottles are purchased, this must be noted in the work or field QA plan and approved by the NCR. If precleaned bottles are used, a certificate indicating that the bottles are analyte free must be provided.

3.5.1 Cleaning Procedure for Glass Bottles

1. Wash glass bottles, Teflon liners, and caps in hot tap water with laboratory-grade nonphosphate detergent.
2. Rinse three times with tap water.
3. Rinse with 1:1 nitric acid (metals-grade), American Society for Testing Materials (ASTM) Type I deionized water.
4. Rinse three times with ASTM Type I deionized water.
5. Rinse with pesticide-grade methylene chloride using 20 mL for 1/2-gal container and 5 mL for 4- and 8-oz containers.
6. Oven dry at 125°C. Allow to cool to room temperature in an enclosed contaminant-free environment.

Table 3.2 Preservative and holding times for the CLP

Parameter	Container	Preservative	Holding Time	
			Soil	Water
Volatiles by gas chromato- graphy/mass spectroscopy (GC/MS)	Water - 40-mL glass vial with Teflon-lined septa Soil-glass with Teflon-lined septa	Cool, 4°C	14 days	14 days
PCB/ pesticides	G, Teflon- lined-lid	Cool, 4°C	Extract within 10 days, analyze 40 days	Extract within 5 days, analyze 40 days
Extractable organics	G, Teflon lined-lid	Cool, 4°C	Extract within 10 days, analyze 40 days	Extract within 5 days, analyze 40 days
Metals	P, G	HNO ₃ to pH<2	6 months	6 months
Mercury	P, G	HNO ₃ to pH<2	30 days	30 days
Cyanide	P, G	NaOH to pH>12 Cool 4°C add 0.6 g ascorbic acid if residual chlorine present	14 days	14 days
Chromium VI	P, G	HNO ₃ to pH<2	24 h	24 h

7. Place liners in lids and cap containers.

8. Store in contaminant-free area. (Amber glass containers shall not be exposed to sunlight).

3.5.2. Cleaning Procedure for Bottles Used for Volatile Organics (40-mL Glass)

1. Wash glass vials, Teflon-backed septa, Teflon liners, and caps in hot tap water using laboratory-grade nonphosphate detergent.